



R14G-Lx12x Series Sonet / SDH Compliant Quad Port RJ Format Optical Fiber Transceivers

3.3 Volts, 1310nm FP Lasers, Single Mode
Intermediate Reach, up to 200 MBaud

FEATURES

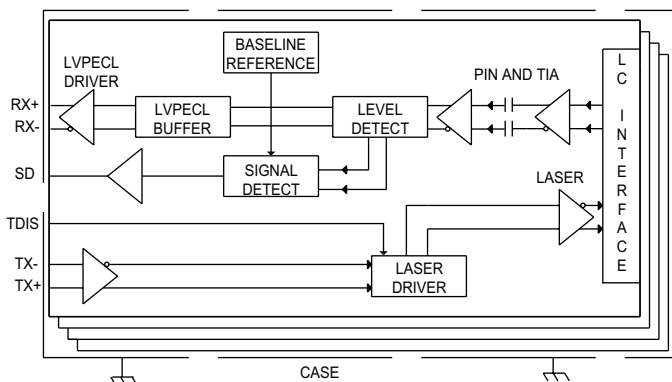
- Compliant with Telcordia GR - 253 and ITU-T G.957/8
- Four RJ style optical transceivers in a single component
- Compatible with solder and aqueous wash processes
- Enables reuse of existing RJ-45 UTP equipment cabinets
- Overall metal shield with enhanced grounding tabs
- Duplex single mode LC receptacle at each port
- Options for LVTTTL or LVPECL Signal Detect functions
- Differential LVPECL inputs and outputs
- Single +3.3 V power supply per port
- IEC 825 / CDRH Class 1 compliant

APPLICATIONS

The R14G-Lx12x single mode glass optical fiber transceivers provide low profile, cost effective solutions for high data rate, single mode (up to 200 Megabaud, up to 15 Km) optical fiber data links with four duplex LC connector interfaces.

These transceivers are fully compliant with the ITU-T, IEEE, Telcordia and ANSI standards but can be used for any other data communications purpose within their operating parameters.

BLOCK DIAGRAM



DESCRIPTION

The R14G-Lx12x fiber optic transceivers consist of transmitter and receiver functions combined in a four port RJ Format "harmonica" module. The optical transmitters are high output 1310nm Fabry-Perot Lasers. The transmitter input lines are driven with differential LVPECL signals applied to the Transmit (TX+ and TX-) pins. The optical transmitters may be disabled by applying LVTTTL signals to the Transmitter Disable (TDIS) pins.

The optical receivers consist of PIN and Preamplifier assemblies and limiting post-amplifier integrated circuits. Outputs from the receivers consist of differential LVPECL data signals on the Receive (RX+ and RX-) pins and single ended LVPECL or LVTTTL signal detect functions on the Signal Detect (SD) pins.

ORDERING INFORMATION

Application	Code	Signal Detect	Temp. Range	Part Number
Fast Ethernet ESCON OC-3 / STM-1	100Base-FX X3.296 I-1, S-1.1	LVPECL	0 to +70° C	R14G-LP12
Fast Ethernet ESCON OC-3 / STM-1	100Base-FX X3.296 I-1, S-1.1	LVPECL	-40 to +85° C	R14G-LP12H
Fast Ethernet ESCON OC-3 / STM-1	100Base-FX X3.296 I-1, S-1.1	LVTTL	0 to +70° C	R14G-LT12
Fast Ethernet ESCON OC-3 / STM-1	100Base-FX X3.296 I-1, S-1.1	LVTTL	-40 to +85° C	R14G-LT12H

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ABSOLUTE MAXIMUM RATINGS

Absolute maximum limits mean that no catastrophic damage will occur if the product is subjected to these ratings for short periods, provided each limiting parameter is in isolation and all other parameters have values within the performance specification. It should not be assumed that limiting values of more than one parameter can be applied to the product at the same time.

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Storage Temperature	T_s	-55		+100	° C
Lead Soldering Temperature	T_{SOLD}			+260	° C
Lead Soldering Time	t_{SOLD}			10	Seconds
Supply Voltage	V_{CC}	-0.5		+6.0	V
Data Input Voltage	V_I	-0.5		V_{CC}	V
Differential Input Voltage (p-p)	V_D			2.0	V
Output Current	I_O			50	mA

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Operating Temperature Limit Part Number xxx-xxxx Part Number xxx-xxxxH	T_A	0 -40		+70 +85	° C
Supply Voltage	V_{CC}	+3.135		+3.465	V
TX Differential Input Voltage (p-p)	V_D	0.350	0.800	1.250	V
Transmit Disable Voltage	V_{TD}	$V_{CC} - 1.3$		V_{CC}	V
Transmit Enable Voltage	V_{TEN}	V_{EE}		$V_{EE} - 0.8$	V
RX Data Output Load	R_L		50		Ohms

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TRANSMITTERS

VCCTX = 3.15V to 3.45V, T_A = Operating Temperature Range

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Baud Rate		10		200	MBaud
Optical Output Power ¹	P_O	-15		-8	dBm
Optical Output Wavelength	λ_{OUT}	1280	1320	1340	nm
Spectral Width	$\Delta\lambda_{RMS}$		2	5	nm
Extinction Ratio	ER	8.2			dB
Supply Current	I_{CC}		120	160	mA
Optical Rise Time	t_R			2	nS
Optical Fall Time	t_F			2	nS

1. BER=10⁻¹⁰ @ 155.52 Mbps, PRBS 2²³-1, NRZ, Compliant with Telcordia GR-253 and ITU recommendations G.957 and G.958

RECEIVERS

VCCTX = 3.15V to 3.45V, T_A = Operating Temperature Range

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Baud Rate		10		200	MBaud
Optical Sensitivity ¹	P_I	-28		-8	dBm
Optical Wavelength	λ_{IN}	1261		1380	nm
Supply Current	I_{CC}		70	120	mA
Signal Detect Assert Time	t_{SDAS}		<10	100	μS
Signal Detect Deassert Time	t_{SDDA}		<10	350	μS
Signal Detect Threshold Decreasing Light	LSTD	-45.0		-32.5	dBm
Increasing Light	LSTI	-45.0		-32.0	dBm
Signal Detect Hysteresis	HYS	0.5	2.25	3.5	dB
RX Data Output - Low	$V_{OL} - V_{CC}$	-1.810		-1.475	V
RX Data Output - High	$V_{OH} - V_{CC}$	-1.165		-0.880	V

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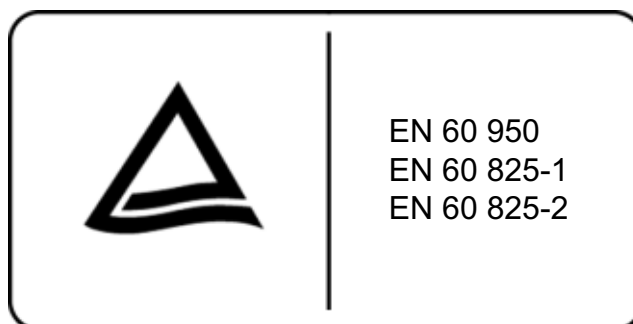
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REGULATORY COMPLIANCE

Requirement	Feature	Condition	Notes
MIL-STD-883-3015.7	ESD	Class II	2200V
IEC-801-2	ESD	Human Body Model	25KV
IEC-801-3	EMI	Immunity	10V/M
FCC	EMI	Class B	>20dB
EN 55022 (CISPR 22A)	EMI	Class B	10V/M
IEC-825 issue 1993-11	Eye Safety	Class 1	TUV Certificate Number R 2171007
FDA CDRH 21-CFR 1040	Eye Safety	Class 1	CDRH Accession Number 9930009



File Number: E209124



File Number: R 2071007

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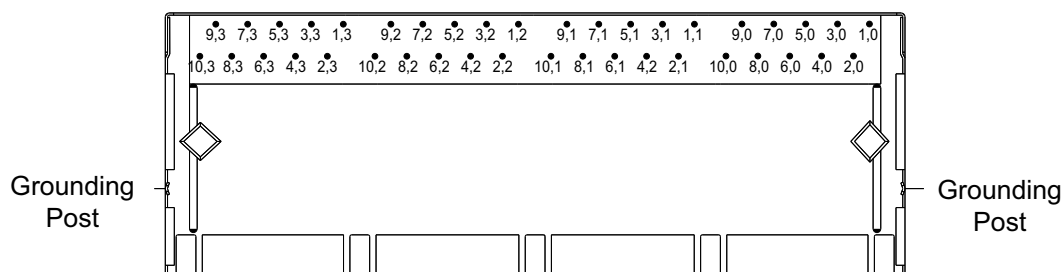
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PIN NUMBER ASSIGNMENTS

Bottom View of Component

For Ports 0 to N

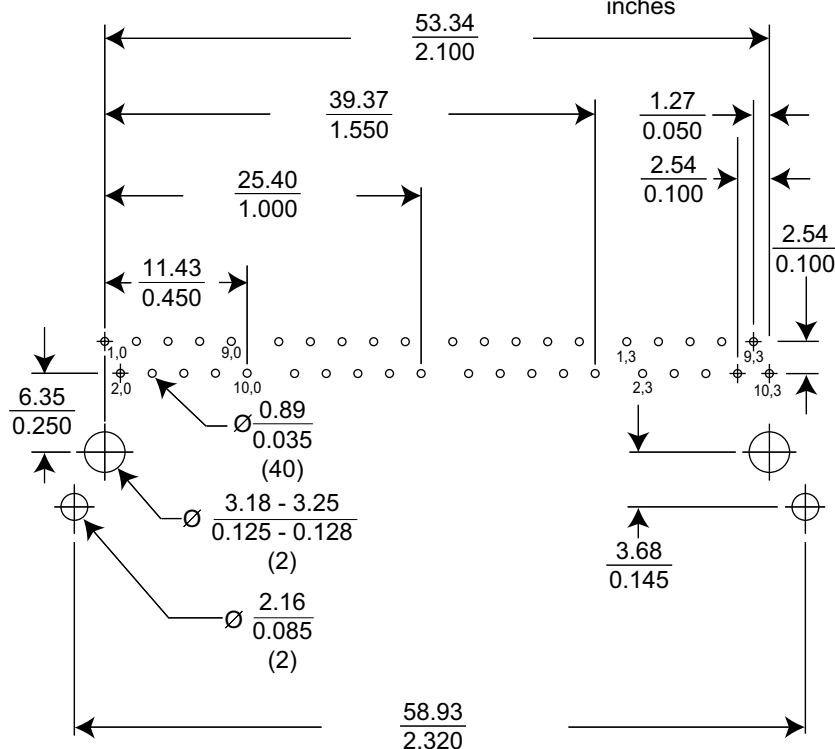
Pin Assignment (Pin #, Port #)



RECOMMENDED PCB HOLE LAYOUT

Top Side View

Dimensions Are Shown As: $\frac{\text{mm}}{\text{inches}}$



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PIN FUNCTIONS

Pin Number (Pin #, Port #)	Symbol (Port #)	Description	Logic Family
GP	GP	Grounding Post <i>Connect to Chassis Ground</i>	N/A
(1, 0)...(1, N)	TXD + (0:N)	Transmitter DATA In	LVPECL
(2, 0)...(2, N)	VEETX (0:N)	Transmitter Signal Ground	N/A
(3, 0)...(3, N)	TXD - (0:N)	Transmitter DATA In	LVPECL
(4, 0)...(4, N)	VCCTX (0:N)	Transmitter Power Supply	N/A
(5, 0)...(5, N)	SD (0:N)	Signal Detect <i>Satisfactory Optical Output: Logic "1" Output</i> <i>Fault Condition: Logic "0" Output</i>	Rxxx-xPxxx LVPECL Rxxx-xTxxx LVTTTL
(6, 0)...(6, N)	TDIS (0:N)	Transmitter Disable	LVTTTL
(7, 0)...(7, N)	RXD + (0:N)	Receiver DATA Out	LVPECL
(8, 0)...(8, N)	VCCR X (0:N)	Receiver Power Supply	N/A
(9, 0)...(9, N)	RXD - (0:N)	Receiver DATA Out	LVPECL
(10, 0)...(10, N)	VEERX - (0:N)	Receiver Signal Ground	N/A

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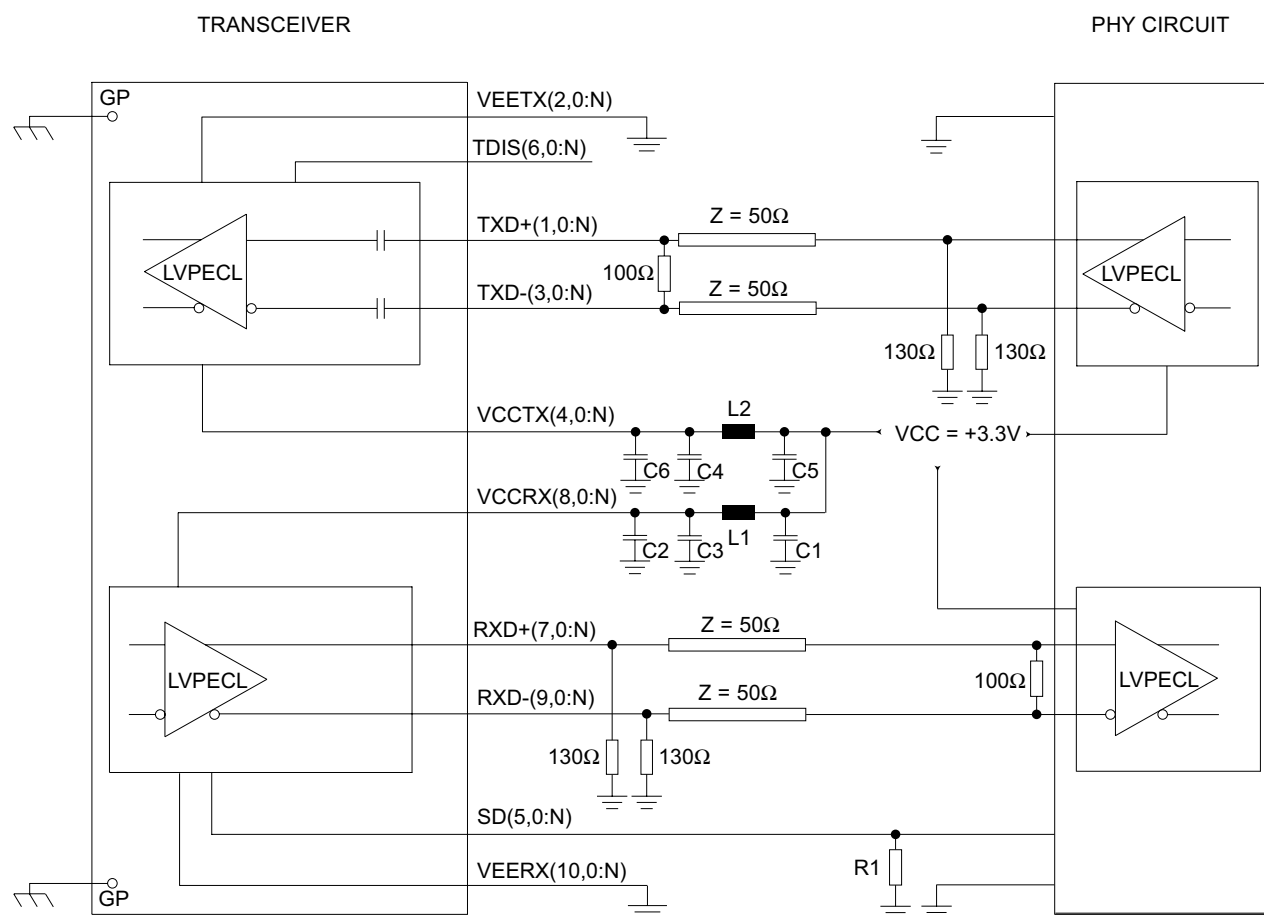
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MULTI-PORT TRANSCEIVER APPLICATION SCHEMATIC

For Interface To +3.3V LVPECL Circuits

(Pin Number, Port Number)



R1 = 150Ω for Rxxx-xP1xx, remove for Rxxx-xT1xx

L1, L2 = 1.0μH to 4.7μH*

C1, C2, C6 = 10.0nF

C3, C4, C5 = 4.7μF to 10.0μF

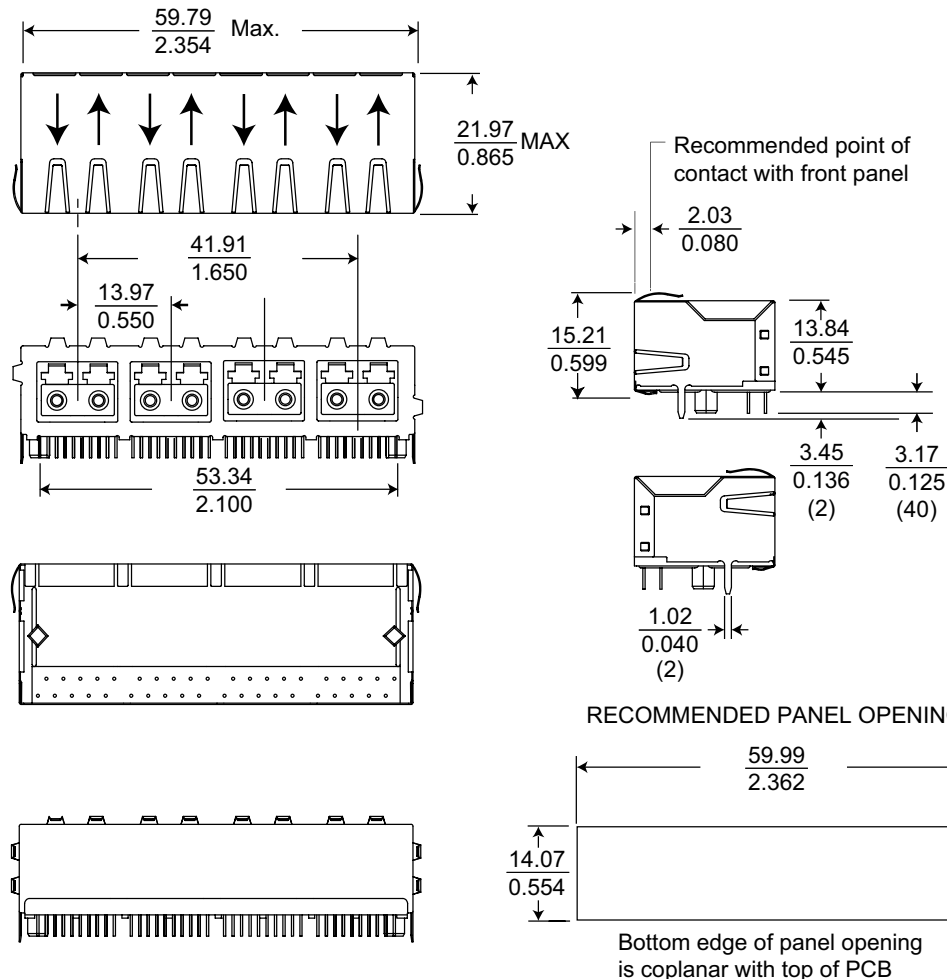
* Or ferrite bead alternative

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TRANSCEIVER OUTLINE DRAWING

Dimensions Shown As: $\frac{\text{mm}}{\text{inches}}$



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